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What is claimed is:

1. A method for fast active scanning on a wireless local area network (WLAN) between a mobile station (STA) and at least one Access Point (AP) comprising the steps of:

(a)   sending a probe request message 210, 305 by an (STA) 238 over a particular channel

5   having a particular Access Point (AP) 258,278 in communication therewith;

(b)   receiving by said particular (AP) 258,278 the probe request message 210,305 sent by the (STA) 238 in step (a);

(c)   sensing by a particular (AP) 278 of a point coordination function (PCF) interframe space (PIFS) 325 of the particular channel; and

10   (d)   sending by said particular (AP) 278 of a probe response message 330 to the (STA) 238 in response to the probe request message after the (PIFS).

2. The method according to claim 1, wherein the probe response message 330 is sent in step (d) by said particular (AP) 278 without performing a backoff interval.

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3. The method according to claim 1m wherein the probe request message 210,305 is a unicast message to the particular (AP) 278.

4. The method according to claim 1, wherein if the STA 238 does not receive a probe

20   response message within a predetermined time period, the STA senses a distributed coordination function interframe space period (DIFS) interframe space 215,306, wherein the STA (i) selects and implements a backoff interval prior to broadcasting the probe request message on the particular channel to all available (APs).

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     5.   The method according to claim 1, wherein if the STA 238 does not receive a probe response message within a predetermined time period, the STA senses a distributed coordination function interframe space period (DIFS) interframe space 215,306, wherein the STA (i) selects and implements a backoff interval prior to broadcasting the probe request message on a different

5   channel than the particular channel.

     6. The method according to claim 1, wherein if the STA 238 does not receive a probe response message within a predetermined time period, the STA selects another (AP) on the particular channel and senses a distributed coordination function interframe space period (DIFS)

10   interframe space 215,306, wherein the STA (i) selects and implements a backoff interval prior to sending another probe request message that comprises a uni-cast message.

     7. The method according to claim 1, wherein if the STA 238 does not receive a probe response message within a predetermined time period, the STA selects another (AP) on a different

15   channel and senses a distributed coordination function interframe space period (DIFS) interframe space 215,306, wherein the STA (i) selects and implements a backoff interval prior to sending another probe request message that is a uni-cast message.

     8. The method according to claim 4, wherein said backoff interval having a range of (0,

20   CW), where CW denotes a Contention Window 110.

     9. The method according to claim 3, wherein only the particular (AP) 278 transmits after the (PIFS) interframe in response to receiving the uni-cast probe request message 215, 305 from an STA.

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10. The method according to claim 1, further comprising:(e) acknowledging receipt of a probe response message 330 by the (STA) 238 in response to the probe request message; and

(f) continuing a hand-off function by the STA (238) with the particular (AP) 278.

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11. A method for fast active scanning ion a wireless local area network (WLAN) between a mobile station (STA) and at least one Access Point (AP) comprising the steps of:

(a) sending a probe request message comprising a uni-cast message by an (STA) 238, 248,

10 268 on the particular channel having at least one Access Point (AP) 258, 278 in communication therewith;

(b) receiving by one particular (AP) 278 the probe request message sent by the (STA) in step (a);

(c) preparing a probe response message by the one particular (AP) 278;

15 (d) sensing by the particular (AP) 278 of a point coordination function (PCF) interframe space (PIFS) 325 of the particular channel; and

(e) sending by said particular (AP) 278 of a probe response message to the (STA) 238 in response to the probe request message.

20 12. The method according to claim 11, wherein if a predetermined time period passes without a response from the particular (AP), after sensing the DIFS interframe space 215, 306 in the (STA) 238 (i) selects and implements said backoff interval prior to broadcasting the probe request message 210, 305 on the particular channel.

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13.   A method for providing handoffs by fast active scanning on a wireless local area
network (WLAN) between a mobile station (STA) 238 associated with a first Access Point (AP)
258 to a new (AP) 278, said method comprising the steps of:

(a)   sensing by a station (STA) 238, 248, 268 for a distributed coordination function (DCF)

5   interframe space period (DIFS) of a particular channel;

(b)   sending a probe request message 210, 305 by a (STA) 238, 248, 268 throughout the
particular channel having at least one new Access Point (AP) 278 in communication therewith;

(c)   receiving by said at least one new (AP) 278 the probe request message 210, 305 sent
by the (STA) 238, 248, 268 in step (b);

10   (d)   preparing a probe response message by the new (AP) 278;

(e) sensing by the new (AP) 278 a point coordination function (PCF) interframe space
(PIFS) 325 of the particular channel;

(f) sending by said new (AP) 278 of a probe response message 330 to the STA in response
to the probe request message 210, 305; and

15   (g)   said (STA) 238, 248, 268 authenticating and re-associating with said new (AP) 278,
followed by the (STA) 238, 248, 268 being handed-off to said new (AP) 278.

14.   The method according to claim 13, wherein the probe response message 330 is sent in
step (f) by said new (AP) 278 without performing a backoff interval.

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15. An Access Point in a wireless local network (WLAN) that provides priority to facilitate
a handoff of a station (STA) 401 between one or more Access Points (AP) 402, 403, comprising:

a probe request sensing unit 405 for sensing when a probe request message has been sent on
a particular communication channel;

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an interframe communication sensing unit 415 for sensing a point coordination interframe

space (PIFS) on the particular communication channel; and

probe response sending means 420 for sending the probe response message after the (PIFS)

sensed by the interframe communication sensing unit 415.

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16.   The Access Point according to claim 15, wherein the interframe communication

sensing unit 415 and the probe response means 420 sense a distributed coordination function (DCF)

interframe space period (DIFS) of a particular channel and respond to probe requests with non-

unicast destination addresses after the (DIFS) and backoff interval.

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17.   A fast active scanning system on a wireless local area network between a first station

[238] and at least one second station [258,278] comprising:

a first station [238] adapted for sending a probe request message [210,305] over a particular

channel having a particular second station [258] in communication therewith;

15   means for receiving by said particular second station [258] the probe request message

[210,305] sent by the first station [238], said means include sensing by said particular second station

[258] a point coordination function interframe space of the particular channel; and

said particular second station [258] being adapted for sending a probe response message

[275] to the first station [238] in response to the probe request message [210,305] after the point

20   coordination function interframe space is sensed.

18.   The system according to claim 17, wherein the probe response message [275] is sent by

said particular second station [258] without performing a backoff interval.

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19. The system according to claim 17, wherein the probe request message [305] sent by the first station [238] comprises a uni-cast message to the particular second station [258].

20. The system according to claim 17, wherein the first station [238] is adapted so that if a probe response message from the particular second station [258] is not received within a predetermined time period, the first station [238] senses a distributed coordination function interframe space period, wherein the first station [238] selects and implements a backoff interval prior to broadcasting the probe request message [305] on the particular channel to all available second stations [258, 278].

21. The system according to claim 17, wherein if the first station [238] does not receive a probe response message [275] from the particular second station [258] within a predetermined time period, the first station [238] senses a distributed coordination function interframe space period, wherein the first station [238] selects and implements a backoff interval prior to broadcasting the probe request message on a different channel than the particular channel.

22. The system according to claim 17, wherein if the first station [238] does not receive a probe response message [275] from the particular second station [258] within a predetermined time period, the first station [238] selects another second station [278] on the particular channel and senses a distributed coordination function interframe space period, wherein the first station [238] selects and implements a backoff interval prior to sending another probe request message that comprises a uni-cast message.

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23. A first station [403] in a wireless local network that provides priority to facilitate a handoff between one or more second stations [402, 403], comprising:

a probe request sensing unit [405] for sensing when a probe request message has been sent on a particular communication channel;

5   an interframe communication sensing unit [415] for sensing a point coordination interframe space on the particular communication channel; and

probe response sending means [420] for sending the probe response message after the point coordination function interframe space sensed by the interframe communication sensing unit [415].

10   24. The first station [401] according to claim 23, wherein the interframe communication sensing unit [415] and the probe response means [420] sense a distributed coordination function interframe space period of a particular channel and respond to probe requests with non-unicast destination addresses after the distributed coordination function interframe space period and backoff interval.